

NEW SPECIES OF RHIZOPINE CRABS (CRUSTACEA: BRACHYURA) FROM NORTHERN AUSTRALIA

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Two new species of rhizopine crabs are described from Australia. *Cryptolutea arafurensis* sp. nov. is described from Darwin and the Gulf of Carpentaria. It is distinguished by the degree of carapace granulation and the prominent anterolateral teeth. *Heteropilumnus longisetum* sp. nov. is only known from the North-West Shelf. It is related to other *Heteropilumnus* species with a coat of long fine setae on their carapace, legs and claws. □ *Brachyura, Pilumnidae, Rhizopinae, Cryptolutea, Heteropilumnus, Australia.*

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Scientific cruises conducted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in northern Australian waters in recent years have produced a large number of brachyuran specimens. Among the material deposited in the Queensland Museum from these cruises are several species of pilumnid crabs of the subfamily Rhizopinae. Two of these species are considered new to science and are treated in this paper.

In the most recent revision of rhizopine taxonomy, Ng (1987) has redefined the concept of the Rhizopinae and removed it from the Goneplacidae and placed it in the Pilumnidae. A number of genera formerly considered rhizopine have been excluded, and *Heteropilumnus*, *Pseudolithochira*, *Luteocarcinus*, *Rhizopoides* and *Zehnimeria* have been added to the group (see also Ng (1990) and Ng & Davie (1991)). It is in the context of this revised concept of the Rhizopinae that the new specimens from northern Australia are treated.

The Rhizopinae have been poorly documented in Australian waters and many specimens have remained unidentified or unrecorded. While this preliminary paper documents two new species, a later paper will attempt to fully document the Australian rhizopine fauna.

Specimens have been deposited in the Queensland Museum (QM) or the Northern Territory Museum (NTM). All measurements are in millimetres (mm) and are of maximum carapace width followed by length, unless otherwise stated.

SYSTEMATICS

Family PILUMNIDAE Ortmann, 1893

Subfamily RHIZOPINAE Miers, 1886

Cryptolutea arafurensis sp. nov.
(Figs 1, 2)

MATERIAL EXAMINED. HOLOTYPE: NTM Cr001279, ♂ (16.7 x 13.4mm), Ludmilla Ck., Darwin, in mangroves, at low water, J. Hanley, 26.2.1982. PARATYPES: NTM Cr001279, ♂ (13.7 x 10.8mm), CSIRO Torres Strait, 7.3.1989. QMW21401, 3 ♂♂ (18.0 x 14.3, 19.5 x 15.6, 17.2 x 14.1mm), 2 ♀♀ (16.0 x 12.6, 16.9 x 13.3mm), 13°02'S, 139°22.2'E, Gulf of Carpentaria, 58m, dredged, CSIRO F.R.V. Southern Surveyor, 24.11.1991. QMW21402, ♂ (13.0 x 10.7mm), 2 ♀♀ (16.6 x 13.2, 13.1 x 10.7mm), data as for QMW21401. QMW21403, 7 ♂♂ (16.5 x 13.2, 16.6 x 13.5, 15.1 x 12.0, 17.2 x 13.7, 13.7 x 11.2, 15.5 x 12.3, 14.7 x 11.5mm), 12°10.5'S, 139°56.7'E, Gulf of Carpentaria, 59m, dredged, CSIRO F.R.V. Southern Surveyor, 24.11.1991. QMW21400, ♂ (14.2 x 11.7mm), 2 ♀♀ (15.5 x 12.4, 16.8 x 13.6mm), 13°25.6'S, 138°36'E, dredged 54m, CSIRO F.R.V. Southern Surveyor, 24.11.1991.

DESCRIPTION. Carapace subquadrate, c. 1.22 times broader than long, somewhat vaulted anteriorly. Dense covering of tomentum present on entire dorsal surface. Carapace surface minutely punctate in central regions; minutely granular towards lateral and posterior margins or nearly smooth in some specimens. Dense scattered tufts of tomentum, of varying density, particularly in anterior third and towards the lateral margins. Carapace regions relatively poorly defined; overlying fine pubescence obscuring surface detail in some specimens. Metagastric grooves well indicated together with forked frontal groove. Sub-

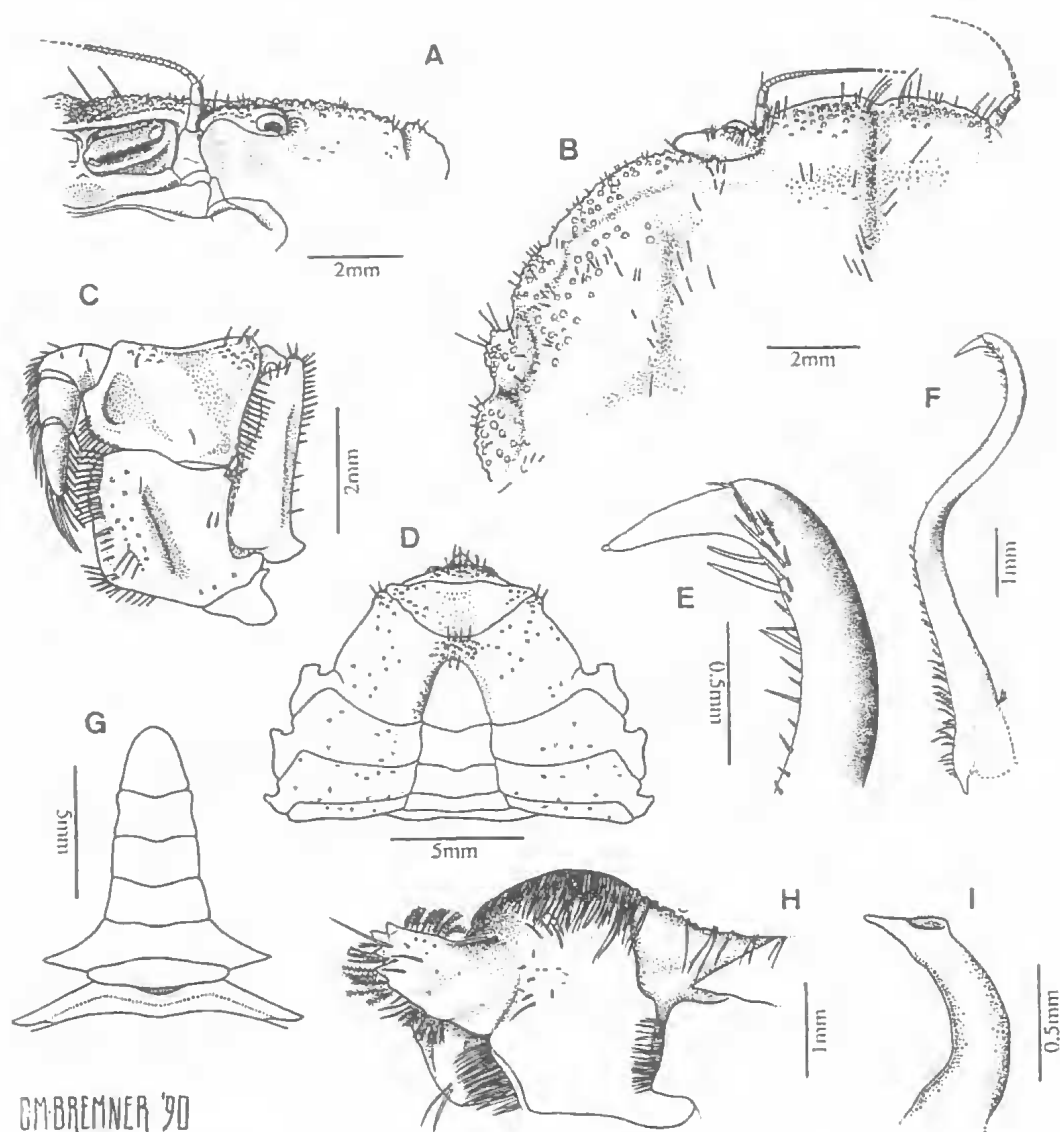


FIG. 1. *Cryptolutea arafurensis* sp. nov., holotype, NTM Cr001279, ♂ (16.7 x 13.4mm). A, frontal view; B, frontal and anterolateral margins; C, 3rd maxilliped; D, sternum; E, F, 1st gonopod; G, abdomen; H, coxal plate of pereopod 5; I, 2nd gonopod.

hepatic lobes well marked. Front deflexed, frontal margin bilobed, a median cleft with groove present; margins fringed with fine setae. Orbits small and shallow but visible from above. Infraorbital margin entire, with internal angle somewhat acute. Ocular peduncles short, bulbous, immovable; cornea darkly pigmented and terminal. Antennules relatively short, folding into oblique fossae. Antennae with basal joint short, flagellum in contact with orbits. Epistome of

moderate length, shallow. Anterolateral margins convex, lobes partially obscured by fringing tomentum; exorbital angle rounded, first anterolateral lobe obtuse, scarcely indicated by shallow notch; following two lobes much more acute and separated by fairly wide U-shaped notches. Posterolateral margins sub-parallel. Subhepatic and pterygostomial regions smooth, but with a few clumps of setae.

Chelipeds subequal, somewhat robust; right cheliped usually larger than left; merus compact and high, trigonal; upper and lower margins fringed with fine setae; outer surface minutely granular; acute tooth present on upper margin. Carpus subovate, outer and upper surface granulate with scattered, long setae; inner surface smooth; prominent obtuse tooth present on interior margin; outer surface covered in fine setae. Palm broad, high and flat, upper and lower margins somewhat keeled; outer surface with conspicuous rows of tuberculate granules, more closely aggregated towards upper margin and sometimes sparse or nearly absent in some specimens; woolly tomentum overlying portions of upper and lower margins and adjoining areas. Index straight or slightly deflexed, with median carina; distal 1/3 usually smooth; lower margin fringed with fine setae. Gape with strong dentition. Dactylus downcurved, with a comb of setae on upper proximal margin, distal end without setae. Hooked tips of chelipeds overlap when closed. Distal 2/3 of index finger and dactylus dark sepia in colour (after preservation).

Ambulatory legs of moderate length, relatively stout and fringed with fine setae. Dactyli styliform, heavily setose. Large projecting serrate plate present on upper surface of coxae of all 4 pairs.

Buccal cavern sub-quadrate. Third maxillipeds incompletely close buccal cavern. Ischium quadrangular, outer surface smooth. Merus sub-quadrate, smaller than ischium; anteroexternal angle strongly produced.

Thoracic sternum punctate. ♂ abdomen evenly tapered and heavily tomentose; with 7 distinct segments; segment 1 covering entire interspace between last pair of ambulatories; segment 2 much shorter; segment 3 longer again, with somewhat acute lateral angles; segments 4-6 with concave margins; telson triangular with rounded apex.

Male genital pore coxal, exposed penis lying in channel between 4th and 5th thoracic sternites. Male gonopod sigmoid-shaped, with hooked tapering terminal portion.

DISTRIBUTION. Darwin, N.T. and the Gulf of Carpentaria; from low-water to 59m depth.

ETYMOLOGY. Name refers to the Arafura Sea.

REMARKS. This relatively large species is the 5th in the genus *Cryptolutea* to be described. This genus is characterised by the presence of a serrate plate on the coxae of the ambulatory legs.

Cryptolutea arafurensis sp. nov. is relatively common in the samples from the Gulf of Carpentaria, being the dominant species of Rhizopinae found. It is, however, highly variable in the degree of granulation on the carapace and cheliped palm, and in the extent of setation. Several specimens exhibited a markedly pubescent carapace whilst others were almost devoid of setae. Similarly, granulation in varying degree was present on the carapace of most specimens, but completely absent on some.

Cryptolutea arafurensis sp. nov. is distinguishable from its congeners by the prominent anterolateral teeth, and by the degree of carapace granulation typically present. In *C. lindemanni* Ward, 1936, the carapace is relatively smooth and the anterolateral margins have less prominent teeth; the anterolateral lobes of *C. teschi* (Serène, 1971) are more tuberculate and less clearly separated as teeth than those of *C. arafurensis*. In addition the carapace of *C. teschi* appears more areolate or rugose than the present species. *C. granulosa* (MacGillchrist, 1905) is more evenly granulate, particularly on the outer surface of the palm, than the present species, and the dense tomentum on the dorsum is absent.

C. sagamiensis (Sakai, 1935) appears closest to *C. arafurensis* but it can be distinguished by the following characters: 1) the anterolateral teeth are more prominent, with the last 2 lobes narrower and showing a tendency to unite with each other; compared with the last 2 lobes being prominent, somewhat acute, and clearly separated from each other in *C. arafurensis*, 2) the larger number of granules on the outer surface of the cheliped palm, 3) in *C. sagamiensis* the merus and carpus of the chelipeds are covered in rudimentary granules, whereas in *C. arafurensis* the carpus, in particular, is covered in prominent vesiculous granules, 4) according to the text-fig. 16(a) of Sakai (1935), the merus and ischium of the 3rd maxillipeds are more rounded in *C. sagamiensis* than in *C. arafurensis*.

***Heteropilumnus longisetum* sp. nov.**
(Fig. 3)

MATERIAL EXAMINED. HOLOTYPE: QMW21423, ♂ (7.5 x 5.3mm), North West Shelf, W. Australia, 19°29.6'S, 118°53.2'E, trawled 37-38m, 25.10.1983, T. Ward (CSIRO). PARATYPE: QMW14449, ♂ (5.6 x 4.0mm), North West Shelf, 02B6BT, 81-82m.

DESCRIPTION OF HOLOTYPE. Carapace 1.4 times broader than long; more or less flat across



FIG. 2. *Cryptolutea arafurensis* sp. nov., holotype, NTM Cr001279, ♂ (16.7 x 13.4mm). A, frontal view of chelipeds; B, dorsal view. Scale lines in mm.

the mesogastric and branchial regions although becoming convex laterally; convex fore and aft over frontal third. Entire surface covered in fine silky setae; moderately long posteriorly, becoming much longer anteriorly; longest setae form transverse fringe across frontal region, and are about 1/3 or more length of carapace. Regions

relatively poorly defined, with only meta/mesogastric region being moderately distinct. Anterior to frontal fringe surface with only very tiny setae; front deflexed, bilobed; most prominent medially; sinuous with obtuse, subacute preorbital angle. Supraorbital margin sinuous, microscopically granular, without fissures.

Infraorbital margin also minutely granular; slightly raised below proximal margin of cornea; inner margin without enlarged tooth or lobe, inner angle rounded, meeting distal margin of basal antennal joint. Antenna with basal segment just touching front; flagellum about as long as frontal setae; each segment armed with 2 or 3 short setae distally; terminal segment with few very long setae distally which make antennae appear much longer. Anterolateral margin consisting of 4 teeth, including exorbital angle. Exorbital angle small, sub-acute, with few small accessory granules on outer margin; 2nd tooth of similar size, leading margin very short, trailing margin long and with few microscopic granules; 3rd tooth most prominent, acute; 4th tooth smallest, clearly defined but little bigger than large acute granule. Greatest carapace width between 3rd anterolateral teeth. Posterolateral margin longer than anterolateral, straight, converging posteriorly. Posterior margin straight, with slightly raised rim.

Third maxilliped with merus c. 1.25 times wider than long and 2/3 as long as ischium; distal margin concave; ischium about as long as wide, inner margin produced, broadly convex and slightly crenulated.

Sternum and abdomen entirely covered with moderately long setae; ♂ abdomen reaching about half distance across fused 3rd and 4th thoracic sternites. ♂ abdomen as figured; telson with convex margins reaching a blunt point, longer than other segments and c. 1.7 times length of penultimate segment; segments 1 and 3 widest, similar in width, occupying entire space between coxae of last pair of legs; 2nd segment c. 0.7 times width of 3rd. ♂ 1st pleopod sigmoid; apical beak relatively long and acutely pointed, projecting laterally rather than recurved; armed with series of fine bristles on inside edge of distal curve.

Chelipeds subequal, right slightly more swollen; merus short, trihedral, unarmed except for row of sharp granules on upper inner border, and few smaller granules on ventral anterior margin. Carpus unarmed, inner angle bluntly pointed, covered in fine setae which are short proximally but very long distally; surface smooth beneath setae, without obvious sculpturing. Palm excluding fixed finger c. 1.25 times longer than high; fingers relatively long, fixed finger c. 1.1 times height of palm, markedly downturned, particularly on left cheliped; both fingers with tips pointed, margins with about 5 large, triangular, sharply crested teeth; dark colouring on teeth entire distally then extending obliquely backwards towards base of gape. Entire outer face of

palm covered in very long, fine, soft setae; surface scattered with granules difficult to see except along outer margins of fingers where they become more conspicuous, especially on left chela. Walking legs missing.

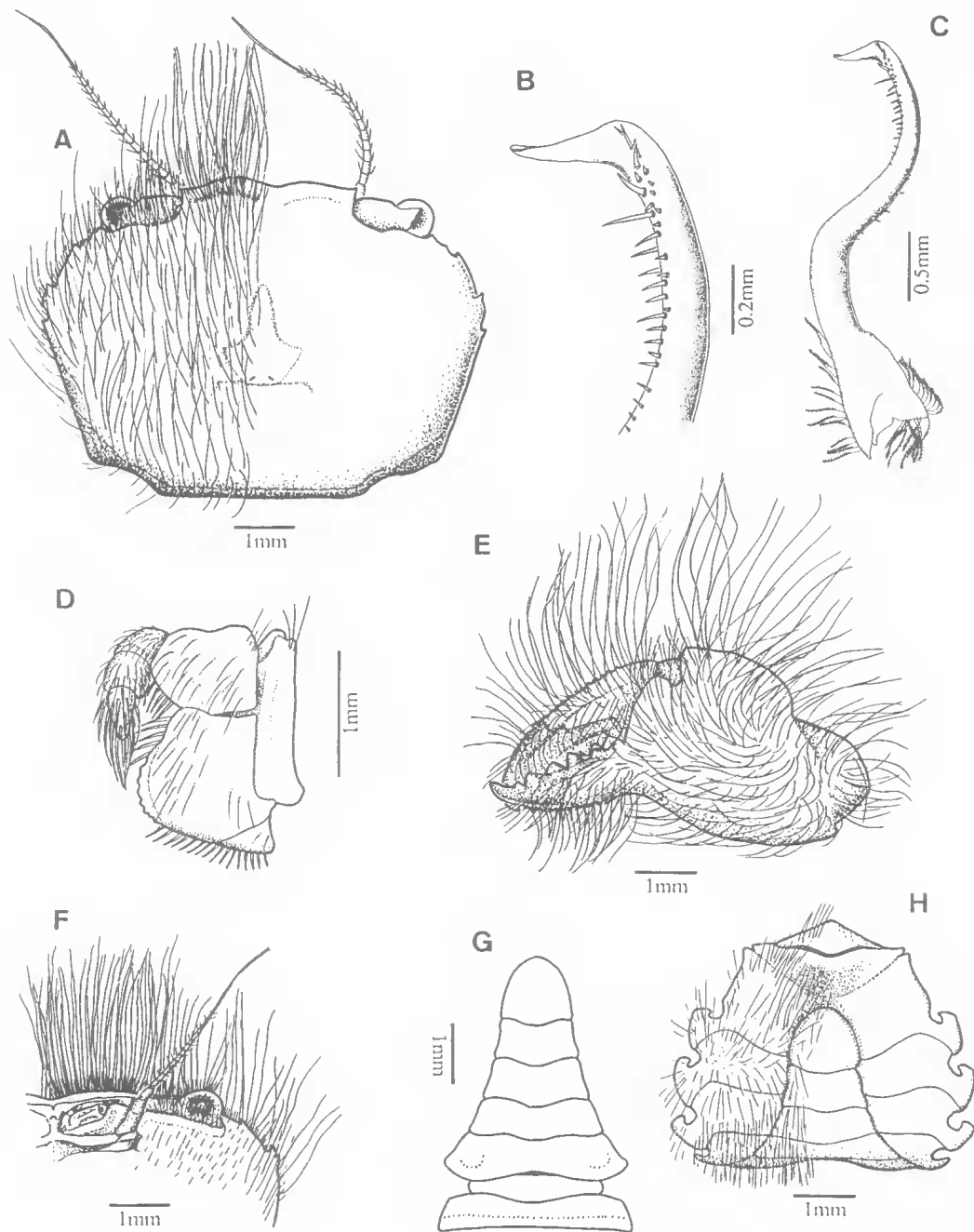
Variation. The smaller paratype male shows some significant variations from the much larger holotype, and is in possession of several walking legs. The carapace anterolateral angles are cut into much more prominent, triangular teeth, and the outer margin of the 2nd tooth appears comparatively shorter. The dark colouring on the fingers of the chelae is restricted to the distal ends, and does not extend backwards along the gape. The tip of the 1st pleopod is not as long and acute. Walking legs moderately long and slender; length of longest c. 1.6 times width of carapace, width of merus c. 0.3 times length; dactylus longer than propodus, tip curved and acute. Propodi, carpi and dactyli bear very long silken setae, particularly on outer borders. All segments unarmed except for a few sharp, irregular granules on the upper margin of the meri.

DISTRIBUTION. Only known from the North-West Shelf, Western Australia; in 37-82m depth.

ETYMOLOGY. Named in reference to the long setae covering the carapace, legs, and claws. It is used as a noun in apposition.

REMARKS. *Heteropilumnus* is a relatively large (18 recognised valid species) and taxonomically confused genus that is in need of a full revision. Despite this there are only a restricted number of species within *Heteropilumnus* that resemble *H. longisetum* sp. nov. in bearing a coat of long fine setae on their carapace, legs and claws. The closest in appearance to *H. longisetum* sp. nov. are *H. ciliatus* (Stimpson, 1858), *H. lanuginosus* (Klunzinger, 1913), *H. splendidus* (de Man, 1929) and *H. trichophoroides* (de Man, 1895). Comparing our new species with the figures of *Heteropilumnus ciliatus* given by Shen (1936: text-fig. 2 [as *H. cristadentatus* Shen, 1936]) and Sakai (1976: pl. 176, fig. 3) *Heteropilumnus longisetum* differs from *H. ciliatus* by the much lower, less prominent, anterolateral teeth; the more extensive covering of longer setae particularly over the posterior half of the carapace; and the outer distal margin of the merus of the 3rd maxilliped being not produced.

It differs from the original figures of *H. lanuginosus* (Klunzinger, 1913: pl. 2, fig. 18; pl. 7, fig. 4) by lacking the broad tooth on the inner margin of the infraorbital margin. *H. splendidus*



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FIG. 3. *Heteropilumnus longisetum* sp. nov., holotype, QMW21423, ♂ (7.5 x 5.3mm). A, dorsal view of carapace; B, C, 1st gonopod; D, 3rd maxilliped; E, left chela; F, frontal view of orbit and antennae; G, abdomen; H, sternum.

can be easily separated because of its lack of clearly defined anterolateral teeth (see de Man (1929: pl. 1, fig. 3-3c; pl. 2, fig. 3d-f). Finally it differs from *H. trichophoroides* (cf. figures of de Man (1895: 13, fig. 8a-e) and Rathbun (1910: fig. 40, pl. 1, fig. 8 [as *Pilumnus borrailei* Rathbun, 1909]) because the posterolateral margins are less convergent; the frontal margin is less produced; the regions on the carapace are much less defined; and the setae of the carapace are much longer.

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LITERATURE CITED

- KLUNZINGER, C.B. 1913. Die Rundkrabben (Cyclometopa) des Roten Meeres. Nova Acta Academiae Caesarea Leopoldino-Carolinae Germanicum Naturae Curiosorum 99(2): 103-402, figs 1-14, pls 5-11 [1-7].
- MACGILCHRIST, A.C. 1905. Natural History Notes from the R.I.M.S.S. "Investigator", Capt. T.H. Heming, R.N. (retired), commanding. Series III., No. 6. An account of the new and some of the rarer Decapod Crustacea obtained during the surveying seasons 1901-1904. Annals and Magazine of Natural History 15(87): 233-68.
- MAN, J.G. de 1895. Bericht über die von Herrn Schiffscapitän Storm zu Atjeh, an den westlichen Küsten von Malakka, Borneo und Celebes sowie in der Java-See gesammelten Decapoden und Stomatopoden (Part 1). Zoologische Jahrbücher. Jena. Abteilung für Systematik 8 (Brachyura - *Doelea* to *Cleistostoma*): 485-609, figs 1-15.
1929. On a Collection of Decapod and Stomatopod Crustacea from Pulau Berhala, an Islet situated in the Straits of Malacca. Bijdragen tot de Dierkunde. Amsterdam & Leiden 26: 1-26, pls 1-3.
- NG, P.K.L. 1987. The Indo-Pacific Pilumnidae II. A revision of the genus *Rhizopa* Stimpson, 1858, and the status of the Rhizopinae Stimpson, 1858 (Crustacea, Decapoda, Brachyura). Indo-Malayan Zoology 4: 69-111, figs 1, 2, pl. 1, table 1.
1990. *Luteocarcinus sordidus*, new genus and species, from mangrove swamps in peninsular Malaysia (Crustacea: Decapoda: Brachyura: Pilumnidae: Rhizopinae). Proceedings of the Biological Society of Washington 103(1): 95-9.
- NG, P.K.L. & DAVIE, P.J.F. 1991. The Indo-Pacific Pilumnidae VII. Notes on *Heteropilumnus sasekumari* (Serène, 1971) and *Cryptolutea* Ward, 1936 (Crustacea: Decapoda: Brachyura). Memoirs of the Queensland Museum 30(3): 517-24.
- RATHBUN, M.J. 1909. New crabs from the Gulf of Siam. Proceedings of the Biological Society of Washington 22: 107-14.
1910. The Danish Expedition to Siam 1899-1900. V. Brachyura. Kongelige Danske Videnskabsmed. Selskabs Skrifter. Kjøbenhavn 7(4): 301-68 (1-68), text-figs 1-44, pls 1-2, 1 map.
- SAKAI, T. 1935. New or Rare Species of Brachyura, collected by the "Misago" during the zoological survey around the Izu-Peninsula. Science Reports of the Tokyo Bunrika Daigaku. sect. B, 2(32): 63-88, figs 1-17, pls 6-8.
- SERÈNE, R. 1971. Observations préliminaires sur des Brachyours nouveaux ou mal connus du Sud-Est asiatique (Crustacea Decapoda). Bulletin du Muséum national d'Histoire Naturelle, Paris Ser. 2, 42(5 [1970 (1971)]): 903-18, pls 1-6.
- STIMPSON, W. 1858. Prodrómus descriptionis animalium evertetorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit W. Stimpson. Pars. V. Crustacea Ocypodoidea. Proceedings of the Academy of Natural Sciences of Philadelphia 10: 93-110 (39-56).
- WARD, M. 1936. Crustacea Brachyura from the coasts of Queensland. Memoirs of the Queensland Museum XI(1): 1-13, 3 pls.